

WHAT IS CLAIMED IS:

1. A method in a distributed system having a lookup service with associated network services available in the distributed system and having a client accessing the network services, the method comprising the steps of:

    adding a device to the distributed system, the device containing a new client having a new service;

    broadcasting an object by the new client, the object containing code for communicating with the new client;

    receiving the object by a discovery server, and using the code to send a reference to the lookup service to the new client by the discovery server;

    receiving the reference by the new client; and

    adding an indication of the new service to the lookup service by the new client such that the network services associated with the lookup service remain accessible during the adding of the new service.

2. The method of claim 1, wherein the adding step includes the step of:

    adding to the lookup service a stub containing code and data for facilitating access to the new service.

3. The method of claim 1, wherein the adding step includes the step of:  
adding a service object to the lookup service, the service object having a function for  
performing the new service.
4. The method of claim 1, further including the step of:  
deleting the indication of the new service from the lookup service.
5. The method of claim 1 further including the steps of:  
registering the new client with the lookup service to receive a notification when the lookup  
service is updated;  
determining by the lookup service when it has been updated; and  
sending a notification to the new client when the lookup service determines that it has been  
updated.
6. The method of claim 5 wherein the registering step includes the step of:  
registering a callback routine with the lookup service, and wherein the sending step includes  
the step of:  
invoking the registered callback routine.
7. The method of claim 6 wherein the registering step includes the step of:  
registering a parameter object with the lookup service, and wherein the invoking step  
includes the step of:

invoking the registered callback routine passing the parameter object as a parameter to the callback routine.

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8. A method in a data processing system having a lookup service with associated services available for use in the data processing system, comprising the steps of:  
receiving a request to update the lookup service; and  
updating the lookup service such that services unaffected by the update continue to be available for use while the update occurs.

9. The method of claim 8 wherein the updating step includes the step of:  
associating a new service with the lookup service.

10. The method of claim 8 wherein the updating step includes the step of:  
disassociating one of the associated services from the lookup service so that the one service is no longer available for use.

11. The method of claim 8 wherein the associated services have attributes and wherein the updating step includes the step of:  
modifying the attributes of one of the associated services.

12. A method in a data processing system having a lookup service with associated services, comprising the steps of:

receiving a request to be notified when the lookup service is updated;

determining when the lookup service is updated; and

generating a notification when it is determined that the lookup service is updated.

13. The method of claim 12 wherein the step of receiving includes the step of:

receiving the request from a client, and wherein the generating step includes the step of:

notifying the client of the update.

14. The method of claim 12 wherein the step of receiving includes the step of:

receiving the request from a first client, and wherein the generating step includes the step of:

notifying a second client of the update, the second client being different than the first client.

15. The method of claim 12 wherein the receiving step includes the step of:

receiving a reference to a callback routine, and wherein the generating step includes the step

of:

invoking the callback routine to perform the notification.

16. The method of claim 12 wherein the receiving step includes the step of:

receiving the request to be notified when a new service is associated with the lookup service.

wherein the determining step includes the step of:

determining when the new service is associated with the lookup service, and wherein the generating step includes the step of:

generating the notification when it is determined that the new service is associated with the lookup service.

17. The method of claim 12 wherein the receiving step includes the step of:  
receiving the request to be notified when one of the associated services is disassociated with the lookup service, wherein the determining step includes the step of:

determining when the one service is disassociated with the lookup service, and wherein the generating step includes the step of:

generating the notification when it is determined that the one service is disassociated with the lookup service.

18. The method of claim 12 wherein the receiving step includes the step of:  
receiving the request to be notified when attributes of at least one of the associated services is updated, wherein the determining step includes the step of:

determining when the attributes of the at least one of the associated services is updated, and wherein the generating step includes the step of:

generating the notification when it is determined that the attributes of the at least one of the associated services is updated.

19. A method in a data processing system having a lookup service with associated services, comprising the steps of:

sending a request to the lookup service to be notified when the lookup service is updated; and receiving a notification that the lookup service has been updated.

20. The method of claim 19, wherein the sending step includes the step of:

sending the request by a client, and wherein the receiving step indicates the step of: receiving the notification by the client.

21. The method of claim 19, wherein the sending step includes the step of:

sending the request by a first client, and wherein the receiving step includes:

receiving the notification by a second client that is different than the first client.

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22. A data processing system comprising:

a memory containing:

    a lookup service having indications of services that are available for use;

    a first client for updating the lookup service; and

    a second client for utilizing the lookup service while the first client is updating the lookup service; and

at least one processor for running the lookup service, the first client, and the second client.

23. A data processing system comprising:

a memory containing:

a lookup service with indications of services available for use, the lookup service for receiving requests for notification of when the lookup service is updated, for determining when the lookup service is updated, and for generating notifications when the lookup service is updated; and

a client for sending a request to the lookup service to be notified when the lookup service is updated; and

at least one processor for running the client and the lookup service.

24. The data processing system of claim 23 wherein the memory further includes a second client for receiving a notification that the lookup service was updated.

25. A computer-readable memory device containing a data structure used for accessing a lookup service with associated network services available for use, the data structure containing:  
a notify method for use by a client to register with the lookup service to receive a notification from the lookup service when the lookup service is updated.

26. A computer-readable medium containing instructions for controlling a data processing system to perform a method, the data processing system having a lookup service with associated services available for use in the data processing system, the method comprising the steps of:

receiving a request to update the lookup service; and  
updating the lookup service such that services unaffected by the update continue to be available for use while the update occurs.

27. The computer-readable medium of claim 26 wherein the updating step includes the step of:

associating a new service with the lookup service.

28. The computer-readable medium of claim 26 wherein the updating step includes the step of:

disassociating one of the associated services from the lookup service so that the one service is no longer available for use.

29. The computer-readable medium of claim 26 wherein the associated services have attributes and wherein the updating step includes the step of:

modifying the attributes of one of the associated services.

30. A computer-readable medium containing instructions for controlling a data processing system to perform a method, the data processing system having a lookup service with associated services, the method comprising the steps of:

receiving a request by the lookup service to be notified when the lookup service is updated;  
determining when the lookup service is updated; and  
generating a notification when it is determined that the lookup service is updated.

31. The computer-readable medium of claim 30 wherein the receiving step includes the step of:

receiving the request from a client, and wherein the generating step includes the step of:  
notifying the client of the update.

32. The computer-readable medium of claim 30 wherein the receiving step includes the step of:

receiving the request from a first client, and wherein the generating step includes the step of:  
notifying a second client of the update, the second client being different than the first client.

33. The computer-readable medium of claim 30 wherein the receiving step includes the step of:

receiving a reference to a callback routine, and wherein the generating step includes the step of:  
invoking the callback routine to perform the notification.

34. The computer-readable medium of claim 30 wherein the receiving step includes the step of:

receiving the request to be notified when a new service is associated with the lookup service, wherein the determining step includes the step of:

determining when the new service is associated with the lookup service, and wherein the generating step includes the step of:

generating the notification when it is determined that the new service is associated with the lookup service.

35. The computer-readable medium of claim 30 wherein the receiving step includes the step of:

receiving the request to be notified when one of the associated services is disassociated with the lookup service, wherein the determining step includes the step of:

determining when the one service is disassociated with the lookup service, and wherein the generating step includes the step of:

generating the notification when it is determined that the one service is disassociated with the lookup service.

36. The computer-readable medium of claim 30 wherein the receiving step includes the step of:

receiving the request to be notified when attributes of at least one of the associated services is updated, wherein the determining step includes the step of:

determining when the attributes of the at least one of the associated services is updated, and wherein the generating step includes the step of:

generating the notification when it is determined that the attributes of the at least one of the associated services is updated.

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37. A computer-readable medium containing instructions for controlling a data processing system to perform a method, the data processing system having a lookup service with associated services, the method comprising the steps of:

sending a request to the lookup service to be notified when the lookup service is updated; and receiving a notification that the lookup service has been updated.

38. The computer-readable medium of claim 37, wherein the sending step includes the step of:

sending the request by a client, and wherein the receiving step indicates the step of:  
receiving the notification by the client.

39. The computer-readable medium of claim 37, wherein the sending step includes the step of:

sending the request by a first client, and wherein the receiving step includes:  
receiving the notification by a second client that is different than the first client.